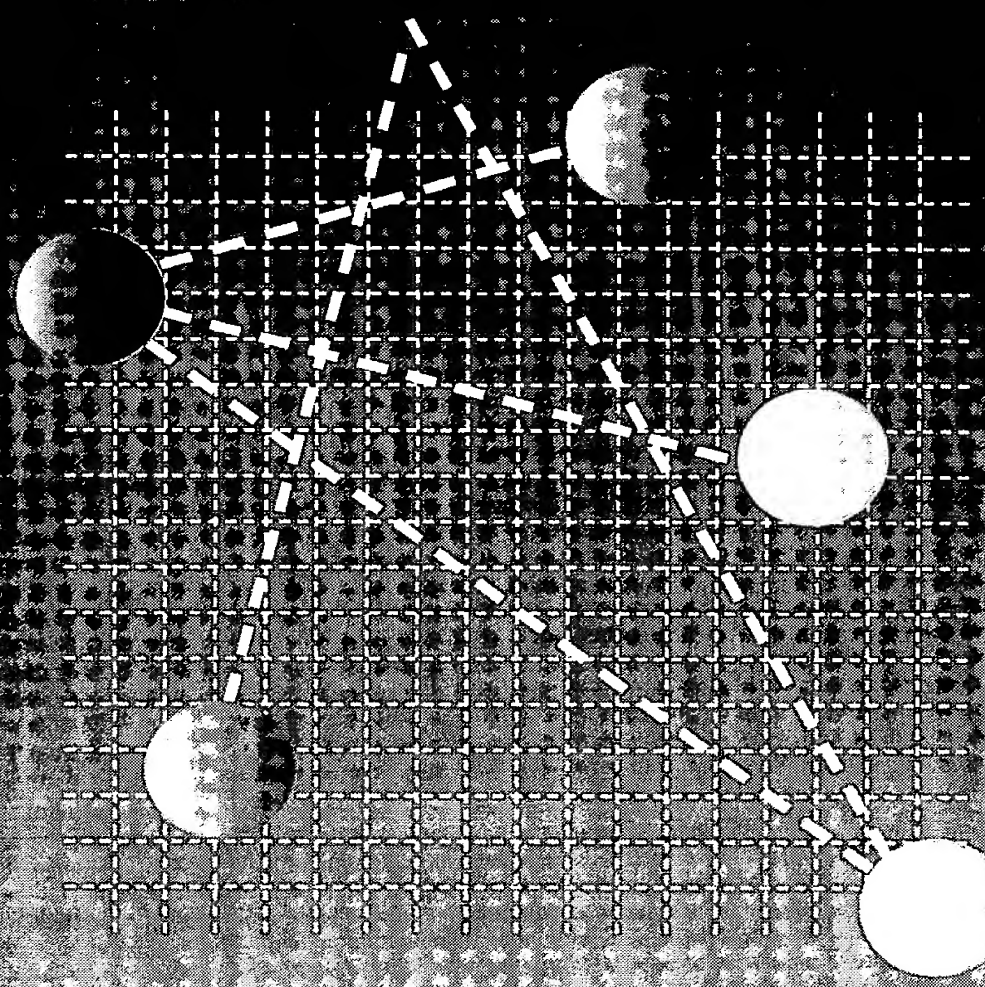
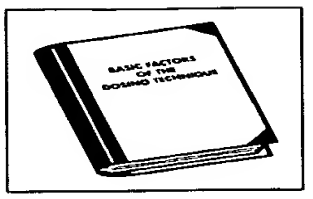
# FLEXO PRINTING AND VARNISHING

## INLINE WITH OFFSET PRINTING



# TRESU

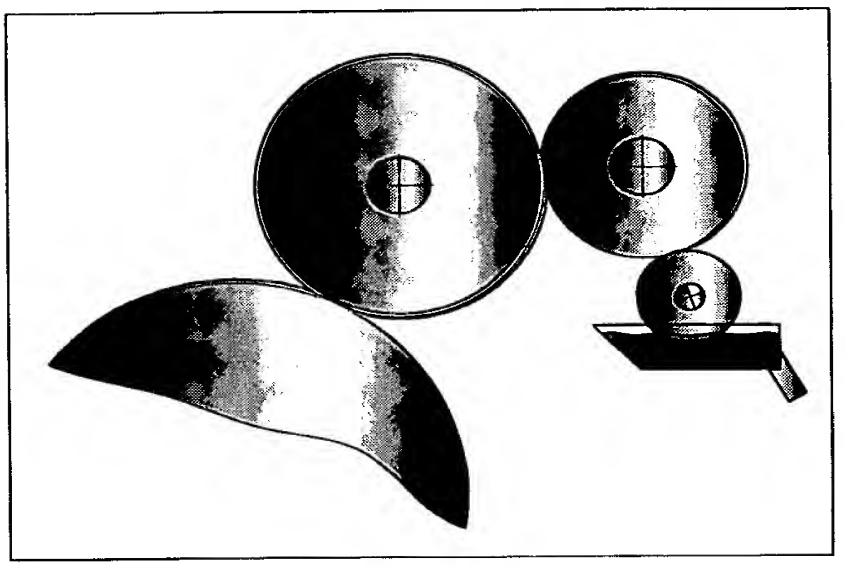
TRESU



# Basic Factors

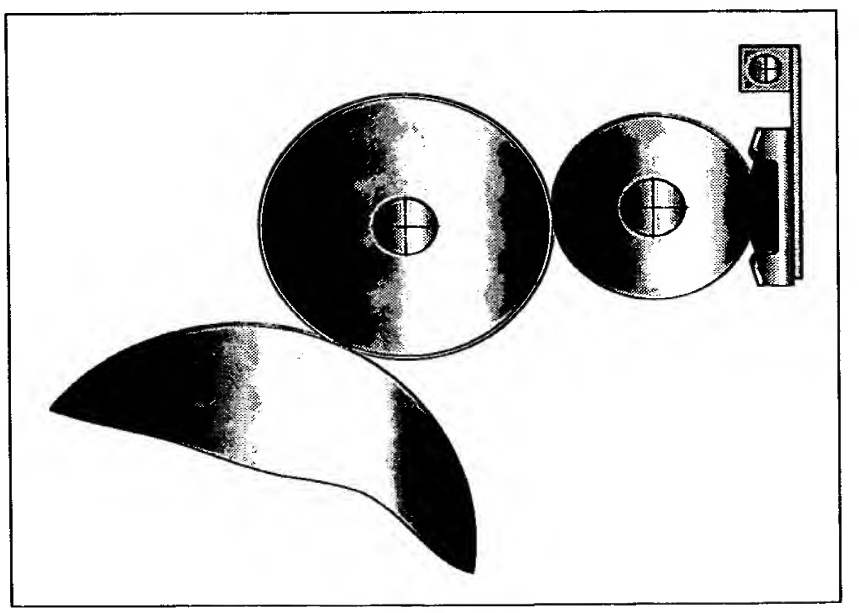
## Of The Dosing Technique

Flexo printing, originally called Aniline printing, is a relatively new process.
In the early days quality was very poor and the process was used as a means to print cheap, basic products.
During recent years Flexo has been developed by various associations, manufacturers and suppliers etc. to complete with more traditional methods such as Rotogravure and Litho.
Four colour process with fine screens are now being printed regularly using the Flexo Process.

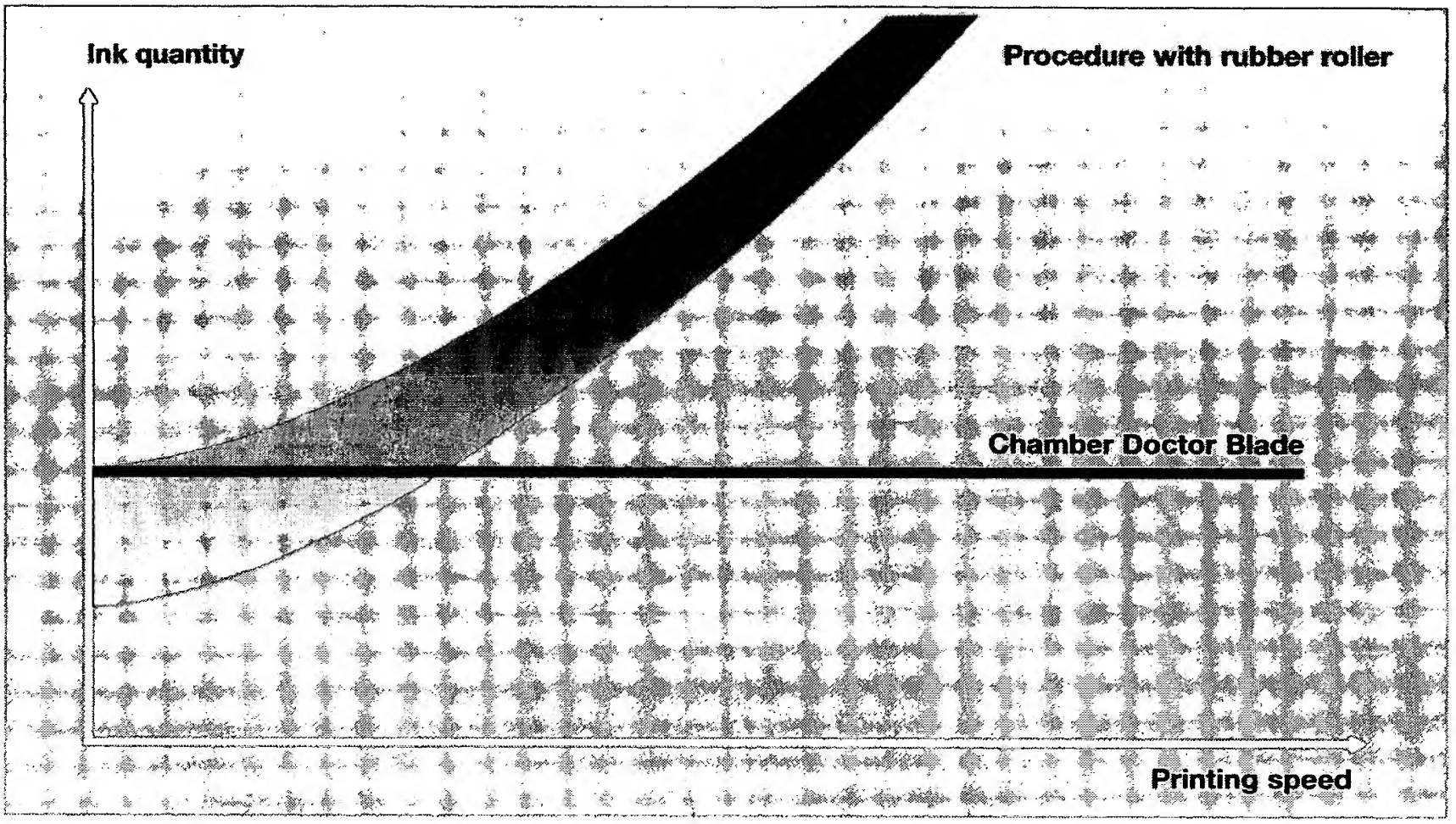


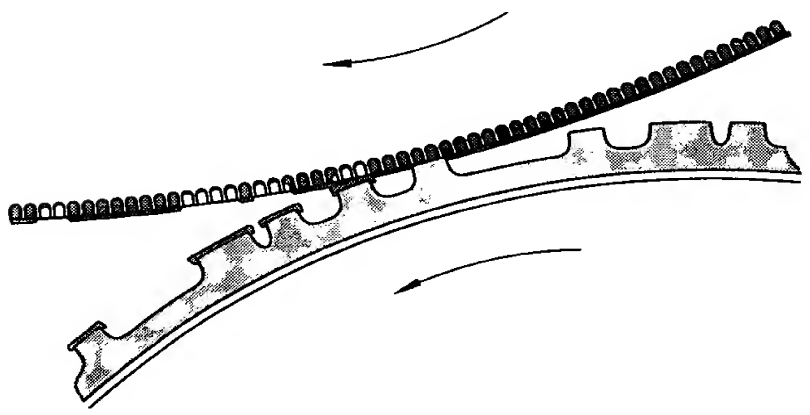
Traditionally the Flexo inking system was made up of 2 rolls, a rubber roller rotating in the ink tray and an engraved roller (Anilox) transferring the ink from the rubber roller to the printing plate.
The amount of ink transferred depended on a number of factors such as the squeeze pressure between the 2 rolls, the screen size of the engraved roll and the machine speed.
Due to the number of factors involved control of the inking system was difficult often resulting in poor quality print.

In order to overcome the problems caused by the 2 roll inking system a new system was developed based on an enclosed chamber.
This system dispenses with the need for a rubber roller and utilises a sealed chamber with doctor blades which when filled with ink only allows the ink in the anilox cells to be transferred to the printing plate.

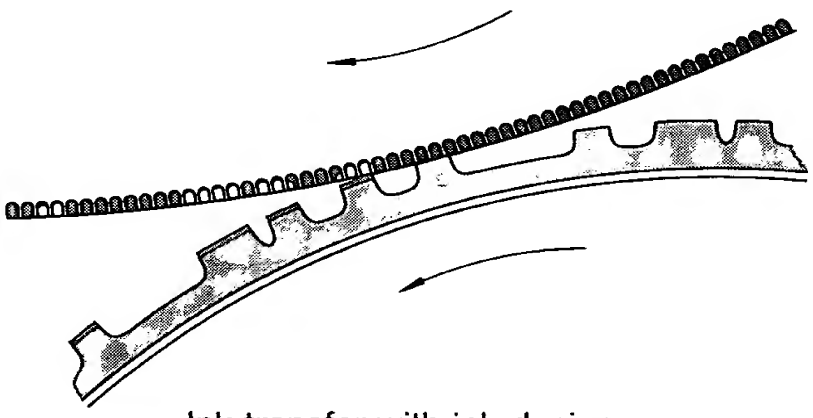


The enclosed Chamber System enables very precise ink metering and dramatically reduces the amount of air in the ink, which is essential when working with UV inks.



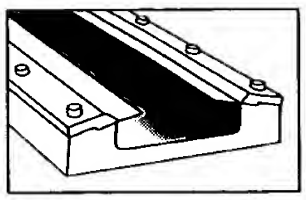
Ink transfer with ink dosing
by using rubber roller



Ink transfer with ink dosing
by using chamber doctor blade

When ink is being correctly applied only the amount of ink contained in the anilox cell is transferred from the anilox roll. This is extremely difficult when using a rubber roller, overdosing will result in filling in the printing plate and colours being too strong and poor quality generally.

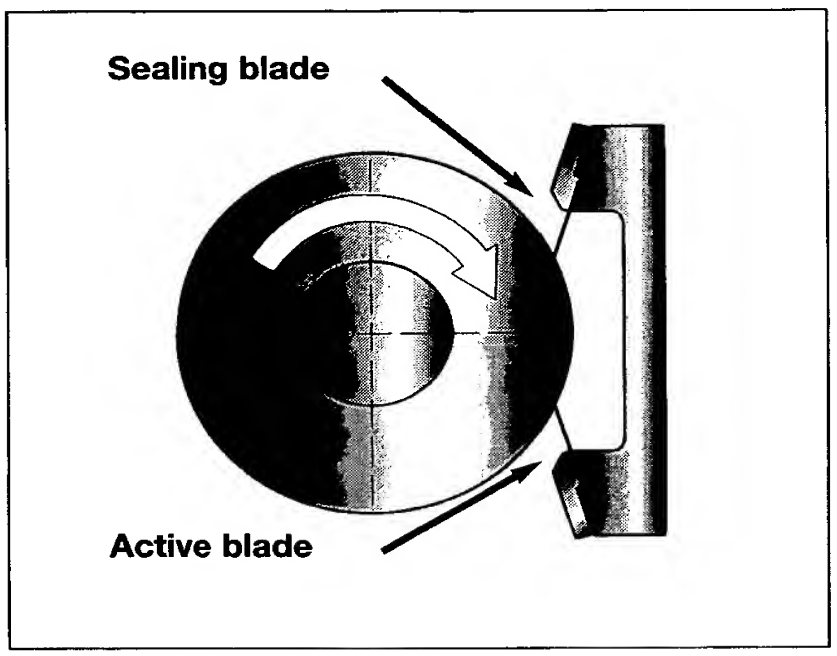
In addition excessive supply of ink will result in more frequent cleaning of the plate resulting in unnecessary downtime and shorter plate life.



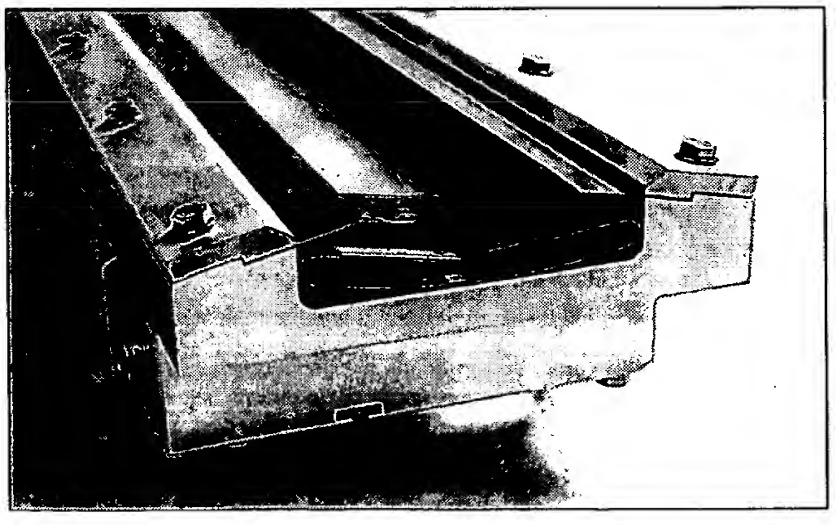
# Chamber Doctor Blade System

Function and Design

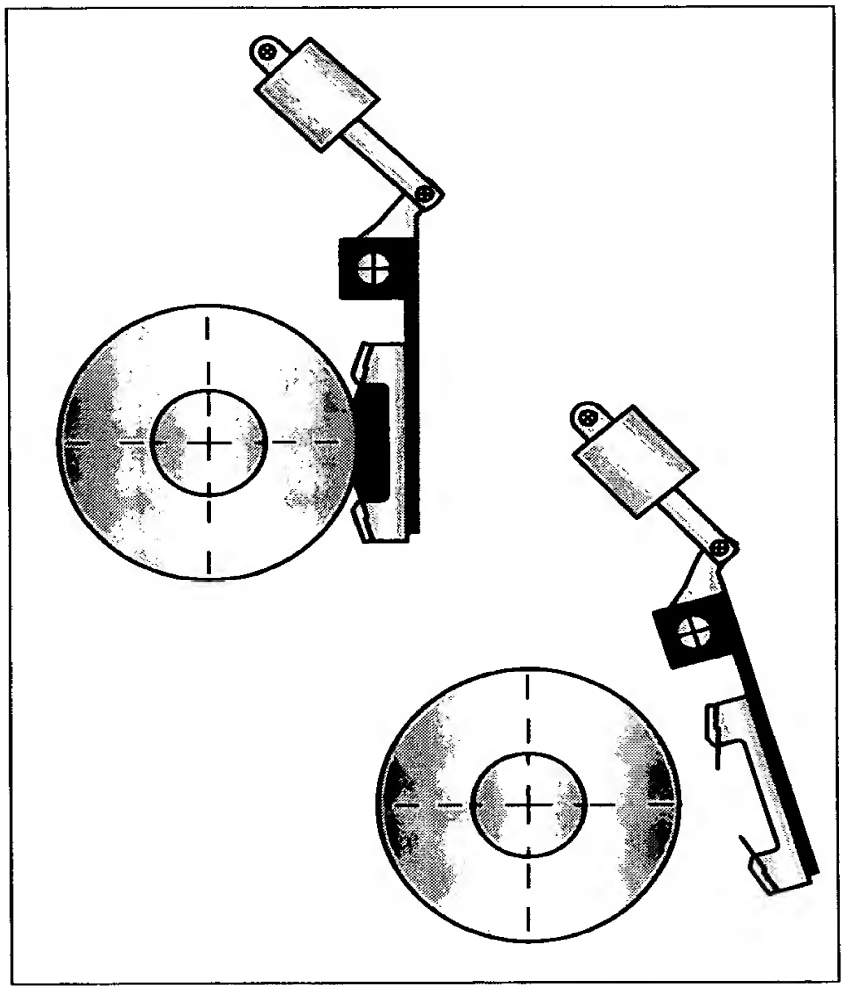
The basis of the chamber doctor blade system is an aluminium chamber which is closed by doctor blades above and below as well as by seals at both sides.
The active blade is doctoring the ink on the anilox roller surface. Only the ink which fits into the anilox cells can pass and be transferred to the printing plate. The other blade is only used as a sealing blade which seals the chamber against the anilox roller.




Both ends of the chamber are closed by seals which are placed tightly to the anilox roller surface. These seals keep the marginal areas of the anilox roller away from ink so that ink cannot spray from the ink system to the printing machine.

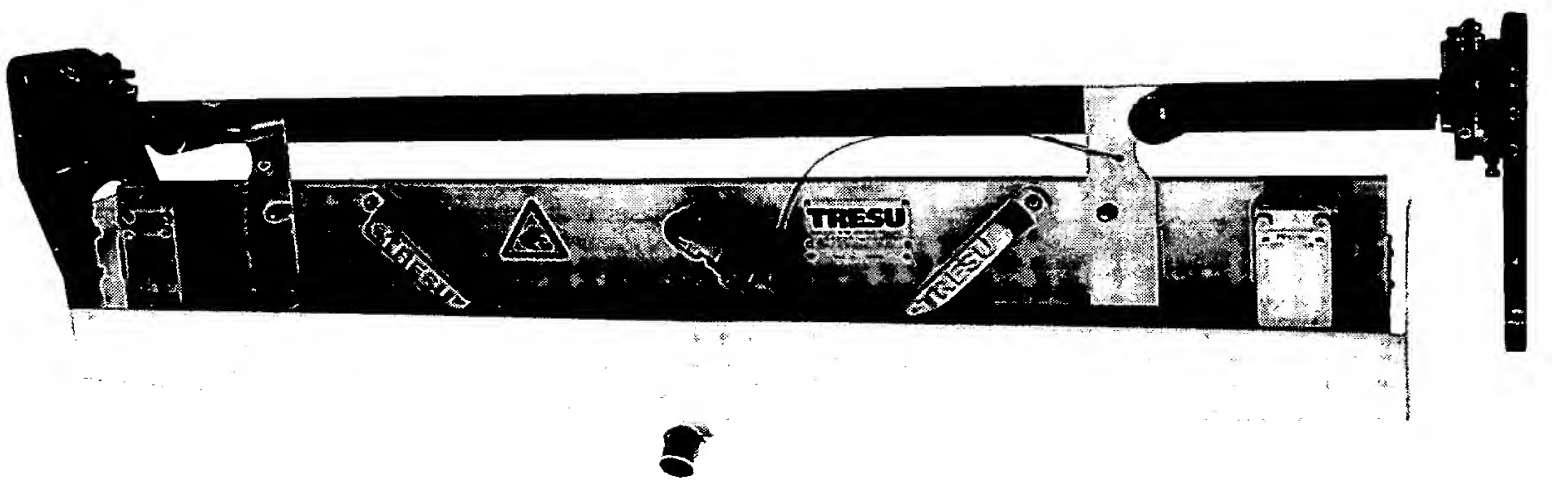


The chamber doctor blade is mounted onto a beam in front of the anilox roller.
By means of the pneumatic adjusting system the chamber is constantly pressed against the anilox roller.



The chamber doctor blade system is adjusted automatically so that additional adjustment when starting is not necessary.
In case of doctor blade wear during the production period the chamber doctor blade will adjust automatically so that a correct doctoring is always guaranteed from the first to the last minute of production.

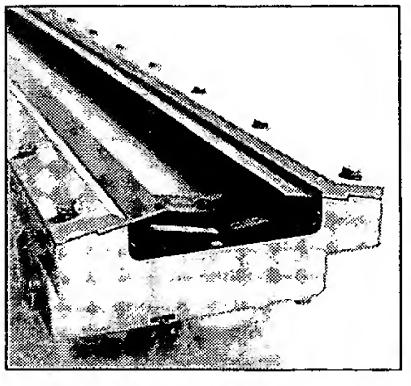
The negative doctoring of the chamber doctor blade system enables a constant doctoring at all printing speeds.
Influencing factors such as viscosity of ink, feeding adjustment as well as evaporation of ink or solvents will be completely eliminated.

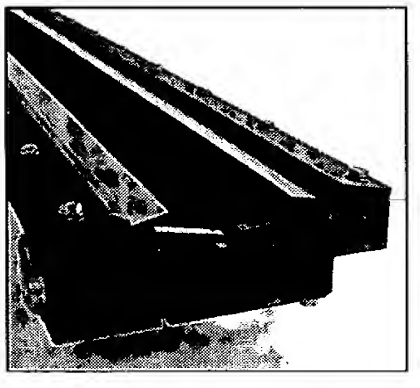



The chamber doctor blade unit is fixed to the mounting beam by hand screws.
No tools are necessary to remove the chamber for cleaning or replacement of blades and seals.

Cleaning of the chamber can be carried out manually or automatically using a chamber cleaning tank.
The chamber should first be flushed through with water or solvents and then removed for final cleaning.

If the system is cleaned manually handsafe



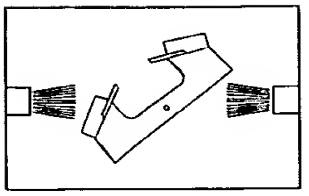


gloves must be worn to protect sharp doctor blades.

Teflon coating of the chamber will speed up the cleaning process.
Spare chambers will reduce downtime by enabling cleaning to be carried out whilst the press is running.

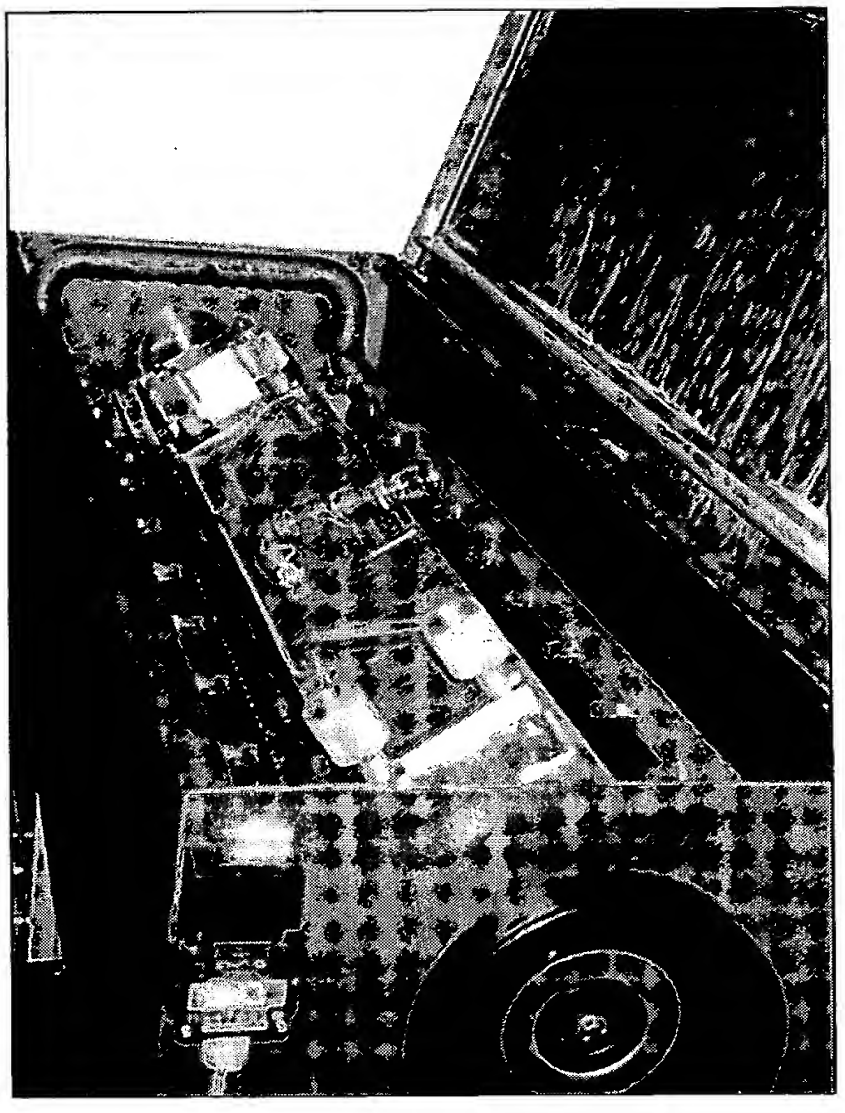
The ink is pumped into the centre of the chamber and returns through outlets at each end.
The automatic air separator in the outlets controls the amount of air in the chamber.
This is essential to prevent foaming.

The enclosed chamber doctor blade system eliminates all the problems previously encountered by the 2 roll system.
In addition the system can be charged by as little as 1 litre therefore reducing press returns to a minimum.
Cleaning times between colour changes are also drastically reduced.

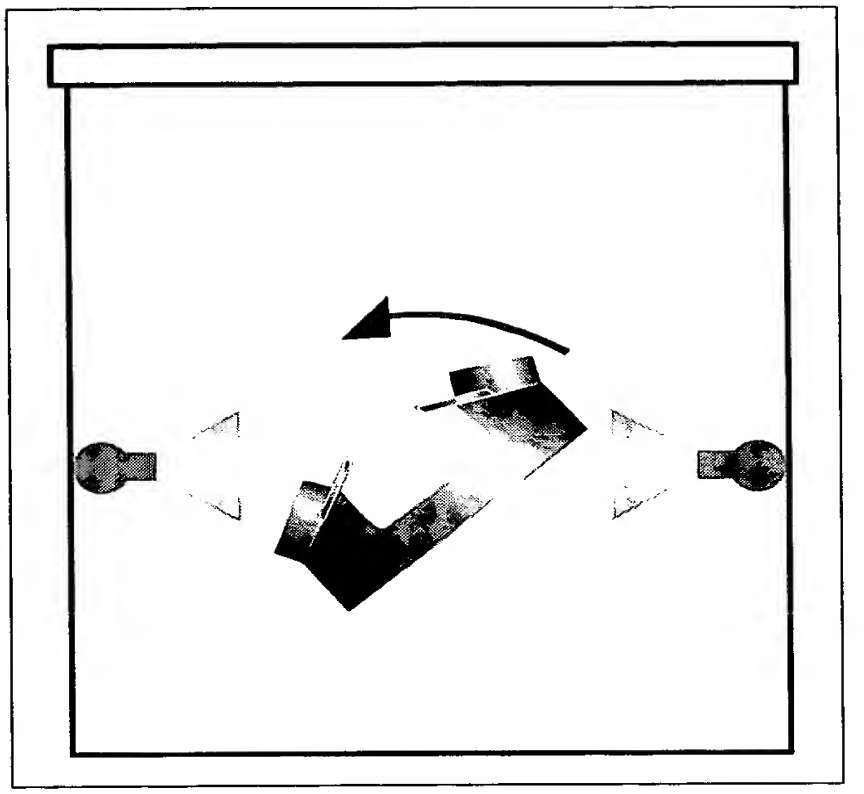


# Chamber Cleaning System

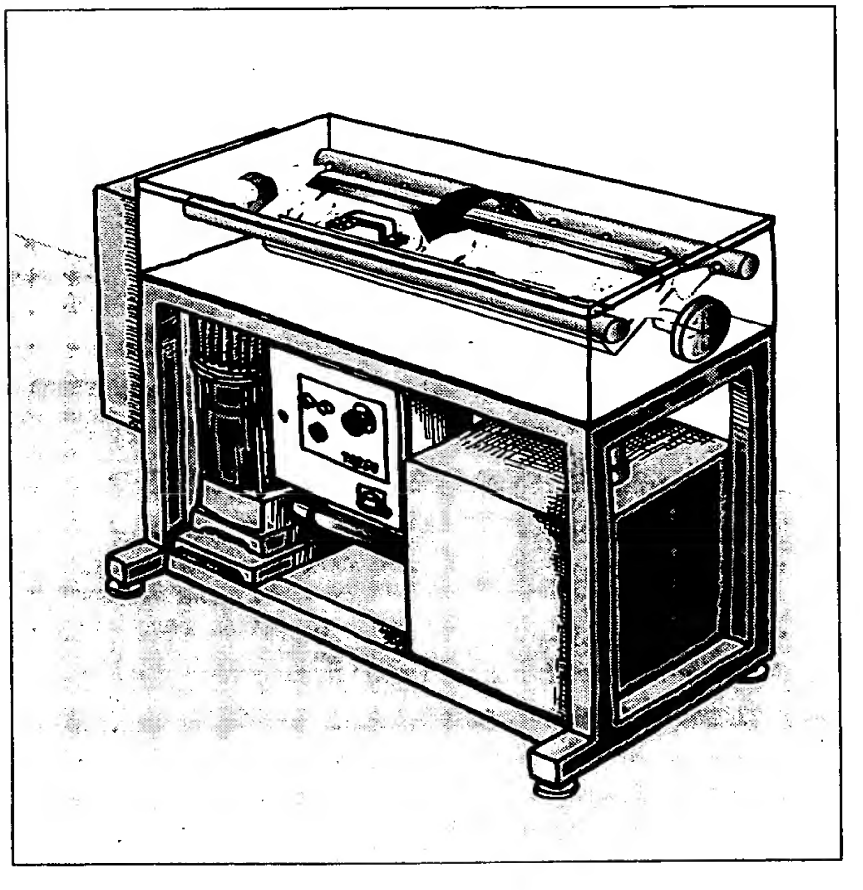
The chamber doctor blade cleaning system works with warm water which is sprayed under relatively high pressure into the slowly rotation chamber. The strategically correct position of the nozzles at the walls of the washing container ensures a complete cleaning of the chamber. From the washing container water and dirt are filtred and flow back to the reservoir where the water is kept at a constant temperature.



After the printing or vanishing process has been finished the chamber will be taken out of the printing unit and put directly into the cleaning system which will then be closed so that the cleaning system can be switched on. The cleaning takes about 15 to 20 minutes and works automatically. After the cleaning process has been finished the cleaning system will be opened and the chamber is in an almost completely dry condition.



The cleaning system works with closed water circulation and should be placed directly beside the printing unit. If necessary, the water has to be changed about four times per year and the filter each month. Due to ink pigments, dirty water and used filters have to be disposed as special waste according to local regulations.



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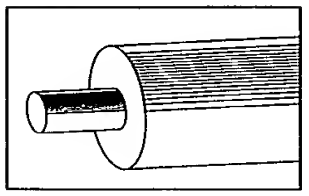
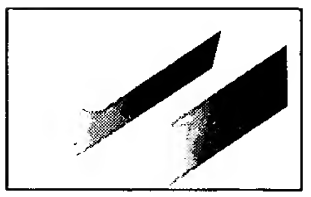


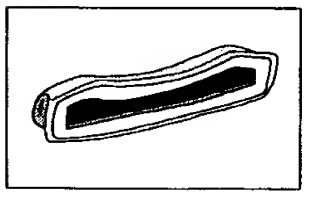
# Anilox Rollers

The ink volume to be printed depends only on form and size of the engraving in the anilox roller. The anilox rollers are classified in categories of which each manufacturer has a different definition.
The main characteristics are number of lines of cells per cm and gravure volume in g/m². However, these details are not definite and a completely different printing result is quite usual when using two anilox rollers of same details, but of different manufacturers.
This is mainly caused by different measuring methods, but also by kinds of engraving such as 45°C respectively 60°C or faster respectively slower lasering, which creates different land conditions and surface quality.



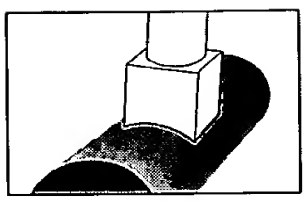
# Doctor Blade

The doctor blade is continuously grinding at the anilox roller surface and hereby cutting off redundant ink from the anilox roller surface. The front side of the doctor blade is pre-grounded and obtains a lamella which enables the printing unit to start immediately without pre-grinding.
The blade lamella has a thickness of 100 µm and has to be handled very carefully due to the fact that the lamella and therefore the doctor blade will be easily destroyed by the smallest impact.
The doctor blade is manufactured in different materials such as carbon steel, stainless steel and polyester. For water based inks the use of stainless steel is recommended because the usual carbon steel blade corrodes and therefore can damage the anilox roller.
Due to non-sufficient doctoring for high-quality printing the polyester blade is suitable only for the sealing blade.
The doctor blade is a wear part and its life expectancy of one day up to several weeks depends on the quality of the anilox roller and the ink structure.
The doctor blade will be delivered in rolls of each 100 m or in fixed lengths.



# Seals

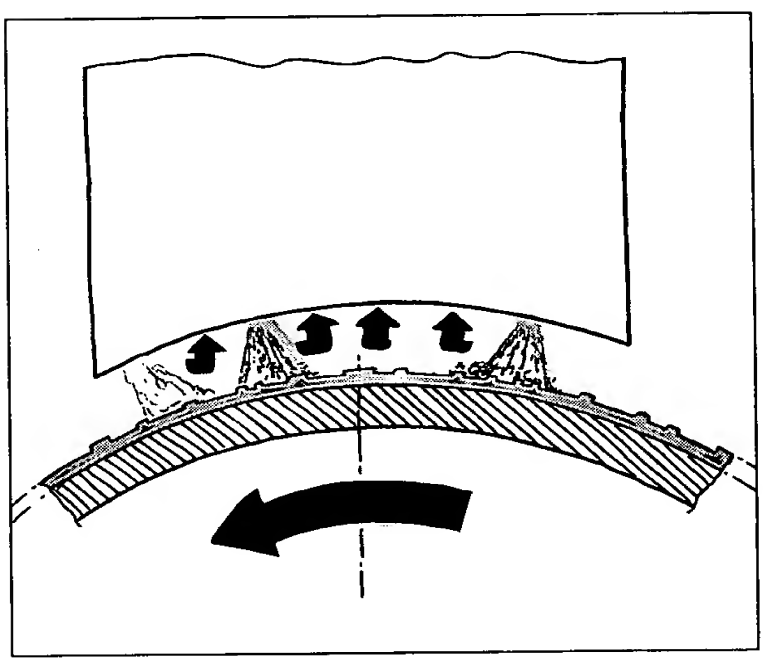
The seals at both ends of the chamber are placed tightly against the anilox roller surface keeping the marginal area of the anilox roller free from ink.
For different kinds of application such as coating with UV varnish or printing with water based gold colours seals of different types and characteristics are used.
Due to permanent grinding of the seals against the anilox roller and the fact that inks have different chemical stresses the life expectancy of the seals is between three days and several weeks.
The seals will be delivered in packages of each 50 units.



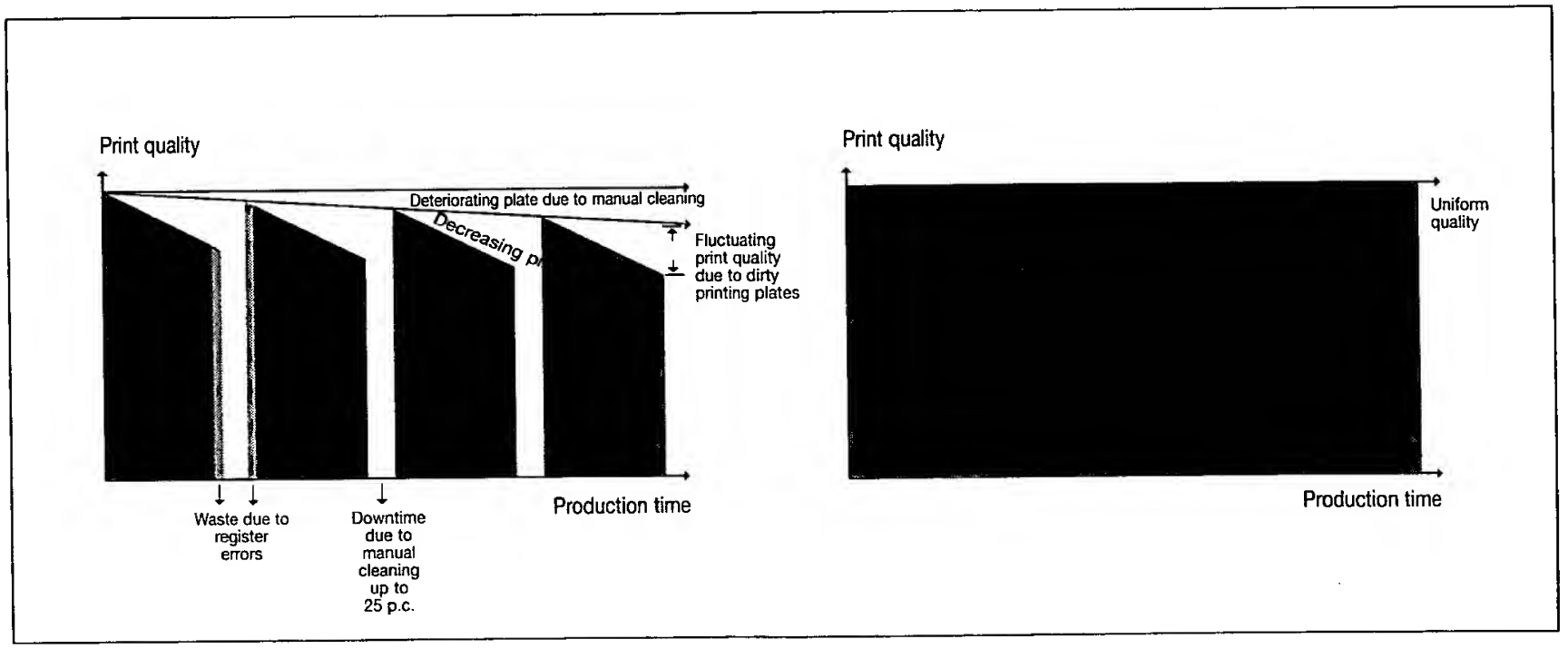
# Printing Plate Cleaner

Function and Design

The TRESU printing plate cleaning system is a new development which enables the plate to be cleaned or kept clean during the printing process, downtime required for cleaning the printing plate during each single job can therefore be reduced to a minimum or even disappears so to obtain printing results of an unusually high and uniform quality.



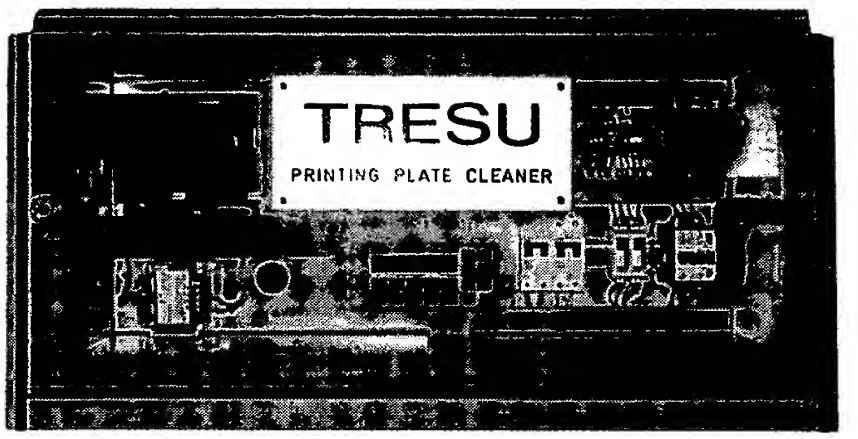
The printing plate cleaning system works with a very fine liquid mist which will be sprayed onto the plate and exhausted again at the same time.
The fine mist removes the dirt particles when bumping on the plate and the complete mixture of dirt and liquid mist is then entirely exhausted.
The cleaning head is put in a position where ink is set free from the plate and where the plate has not been inked again by the anilox roller. In this area the plate can be cleaned without any negative influence on the printing result.



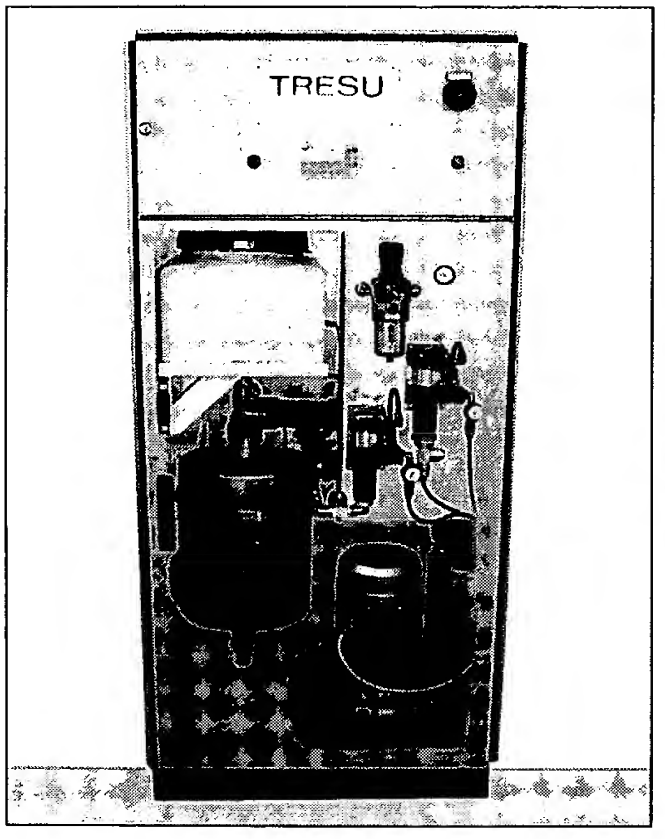

By using the TRESU printing plate cleaner a very high and constant quality can be achieved, furthermore downtime during the cleaning can almost be eliminated even at difficult printing jobs.
There are different increases in productivity for each job, for example a higher productivity of 15-25% has been realized when printing normal and coated paper.

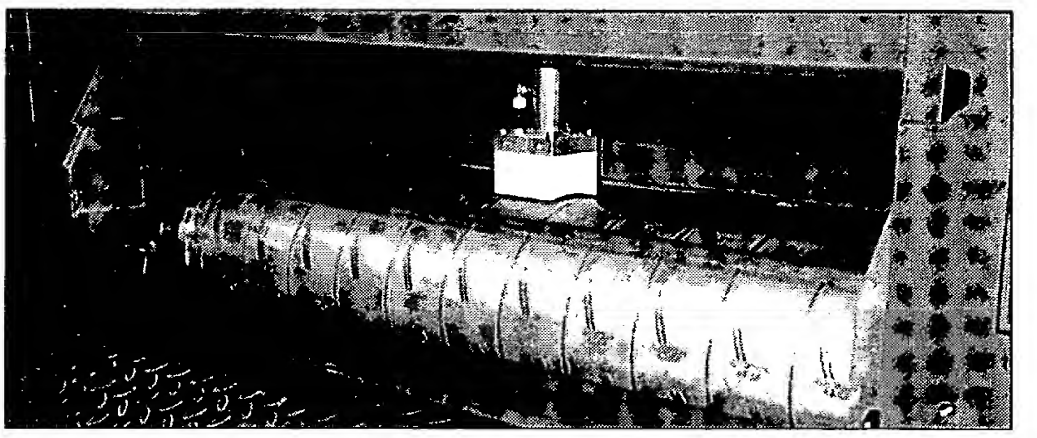
Experiences on diverse varnish units in the offset machines working with gold colours (bronze colours) have shown that more than 80.000 sheets can be printed without any manual cleaning; when printing gold colours without using printing plate cleaner the cleaning interval is usually between 3.000 and 6.000 sheets.

The TRESU printing plate cleaner is designed with a central cabinet where all functions are included. The PLC controlling and supervising the complete cleaning process is integrated in the upper part of the central cabinet.
In front there is a large display showing all actual cycles in clear text and furthermore indicating all errors such as short vacuum, dirty filters, lack of cleaning liquid, etc.
This information given in German, English or in any other EC language enables the operator to repair the failures within shortest time.



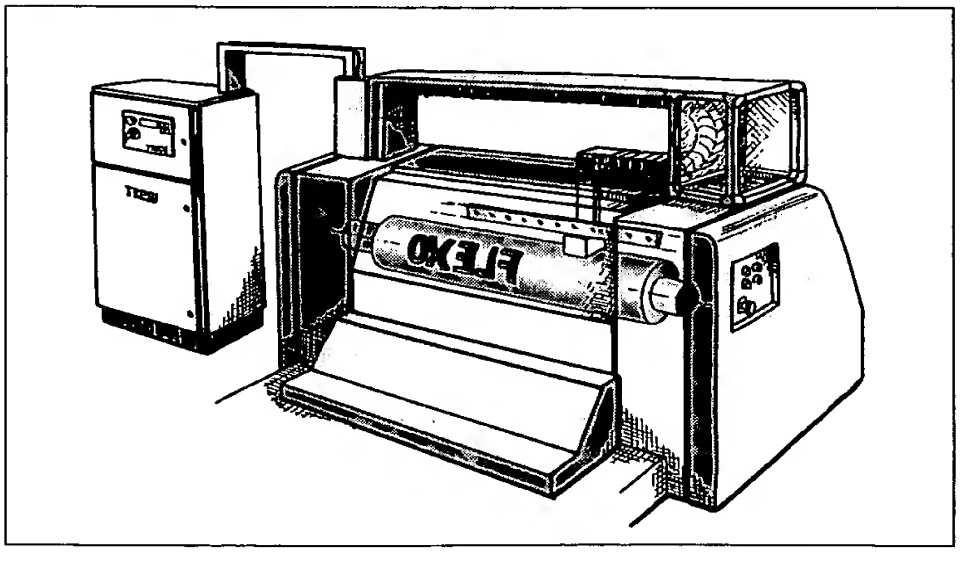

In the lower part of the central cabinet all function elements such as filter system, vacuum pump, cleaning liquid container, high pressure pump, etc. are placed.



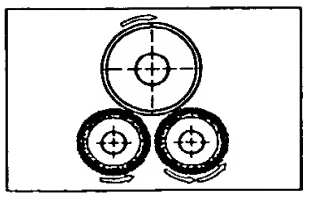



This concentration of all components ensures an ease of operation and the training period of the service personnel can be reduced to a minimum.

The traversable cleaning head is fitted directly on the stereo roller.

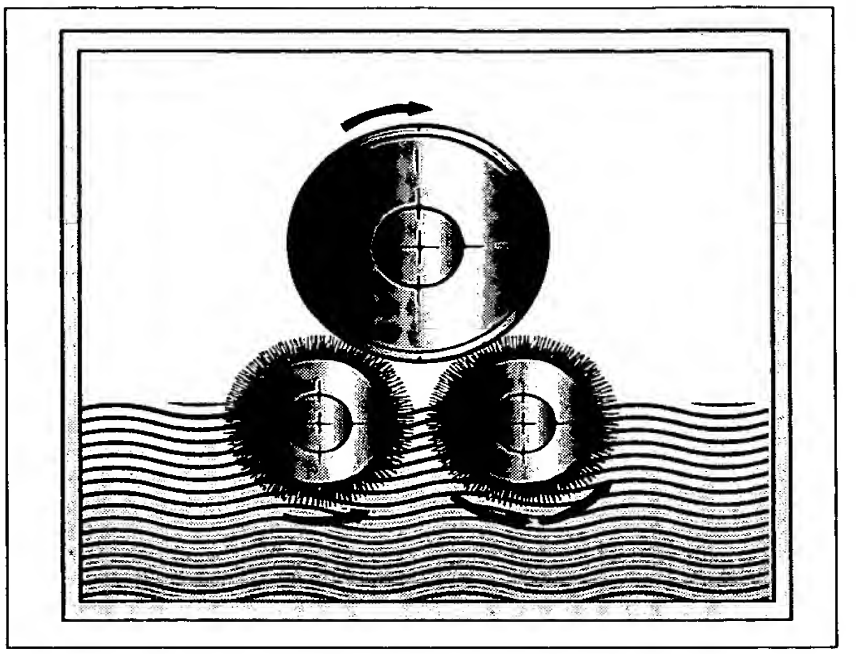



The correct mixing of cleaning liquid and air is adjusted by the ultra nozzle system and takes place immediately before spraying.
The cleaning head moves across the plate at a speed of about 3 m per minute while the plate rotates at normal printing speed. During this slow side motion no single stroke is omitted which ensures an overlapping cleaning of the plate.

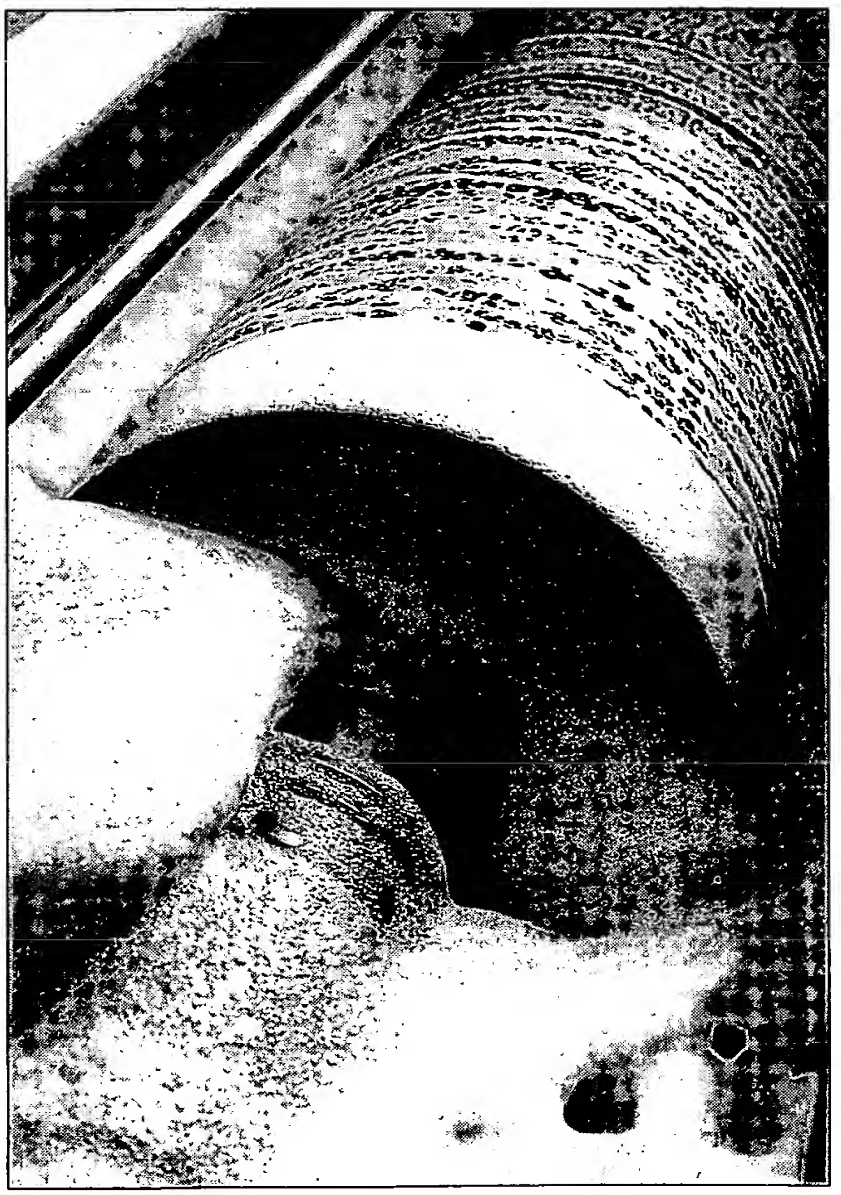


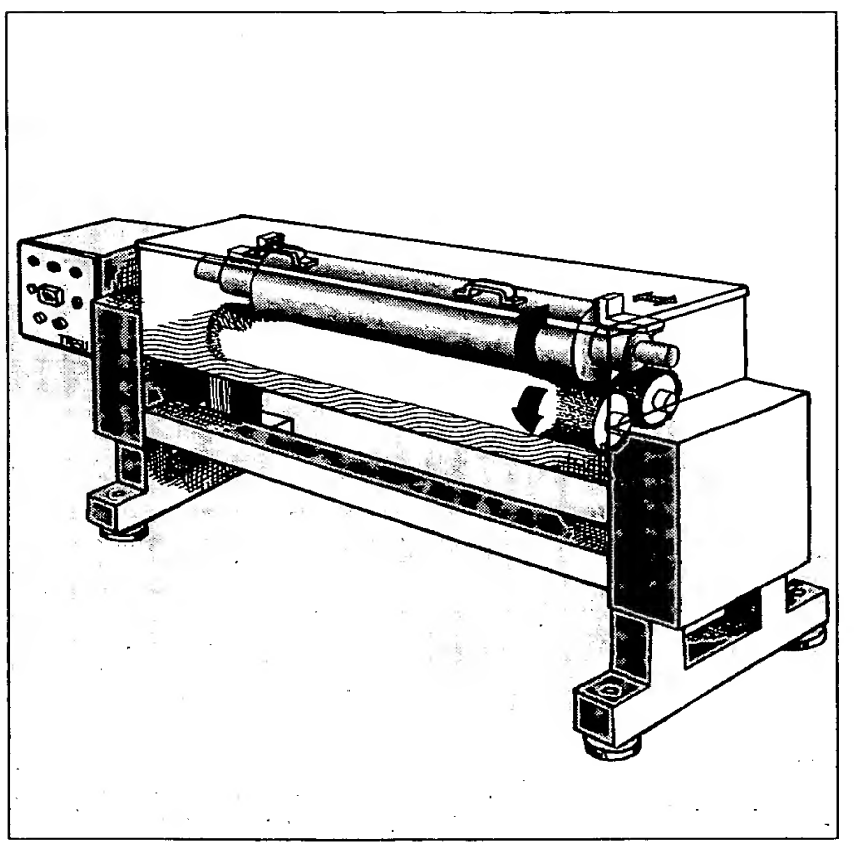
# Anilox Cleaning System

The anilox cleaning system works on a combined brush and solution principle.
The dirty anilox roller is taken out of the printing unit and put directly on two rotating brushed in the cleaning system. Both side brushes are adjusted and the cleaning system is closed. The washing container is filled up with a special soap solution up to about halfway of both brushes.
By a combination between the brush friction while rotating and the soap solution even tenacious dirt particles in the fine engraved cells can be removed.
The brush hair are larger than the openings on the anilox roller surface, the dirt particles are therefore not removed by mechanical friction, but by cavitation of the water particles which are thrown into the engraved cells by the brushes.



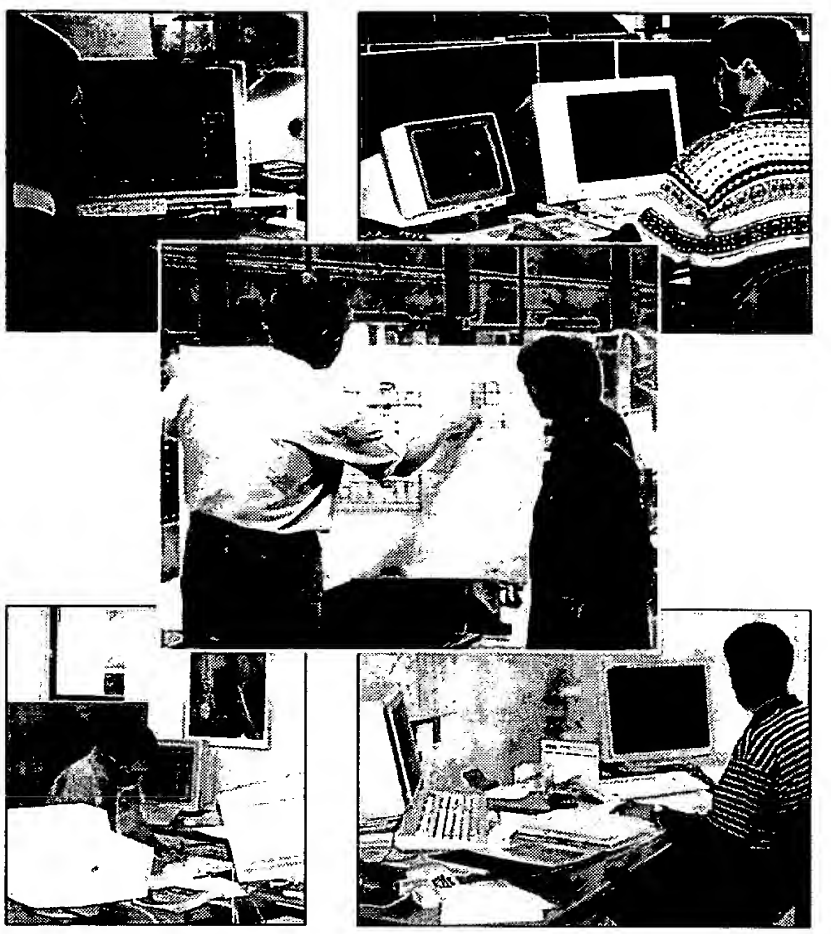
Different industrial detergents can be used for cleaning. We recommend a soap which was especially developed for these cleaning purposes.
This soap is diluted with water giving very effective and especially efficient cleaning.
Due to the cleaning process at approx. 50° C resulting in evaporation a continuous refill is required. Furthermore the complete soap solution has to be changed at least once a year.

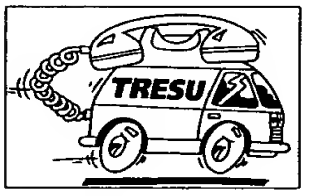




# Consultation

In our head office in Denmark and our service centre in Germany an experienced, well-educated and highly motivated team can be contacted any time you wish to have information regarding application technology as well as any kind of advice and support.
Should there be a lack of specific know-how necessary for a special application various tests in dosing technique can be carried out.
Due to many years experience in handling with a wide range of projects in diverse areas a conception of individual production lines is possible.
TRESU is specialized in particular in quick-running production lines, but special developments with variable dosing technique are not rare either.

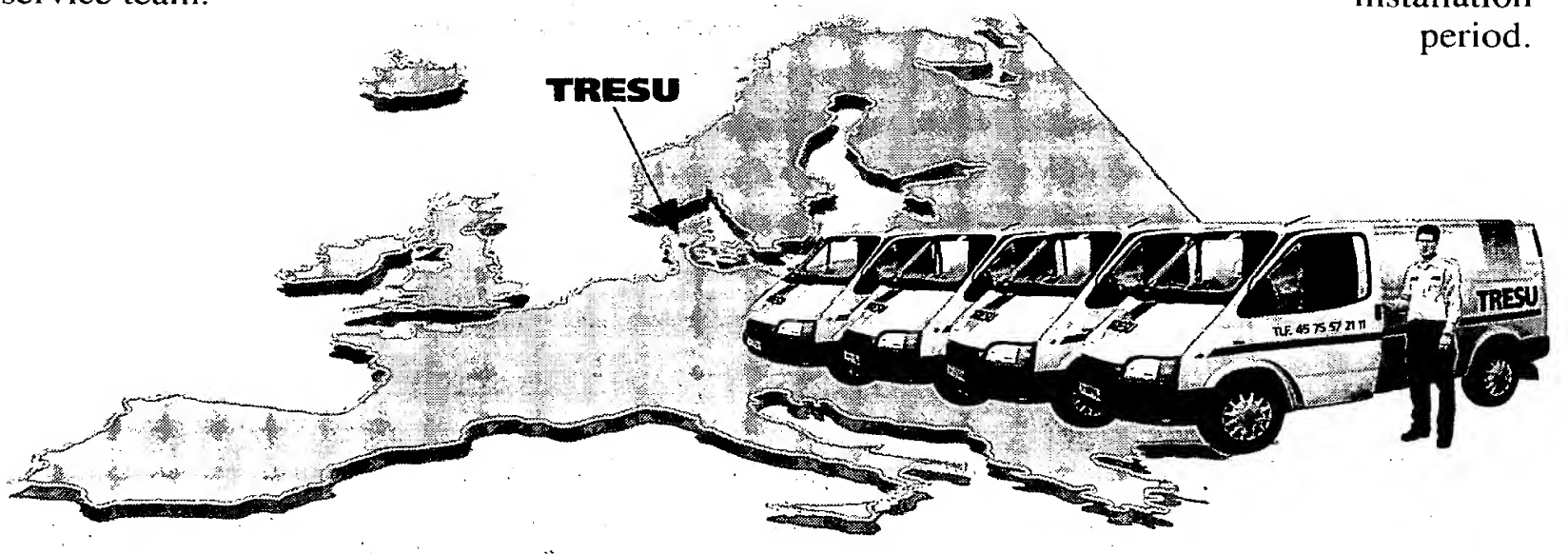


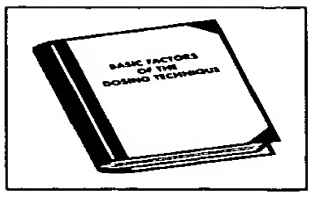



# Installation and Service

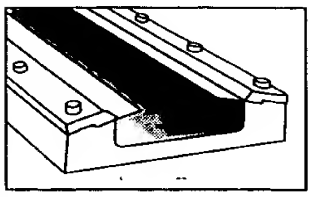
Our service team has many years experiences in installing and commissioning of new additional sets up to total production lines. Complete installations including mechanics and electricity followed by commissioning can be carried out mainly by our engineers with the assistance of company owned or local service team.

Economically, this combination often represents a better solution in case of a new installation.
A further advantage of this combination is the involvement of the company owned service department so that the personnel can be trained during the installation period.

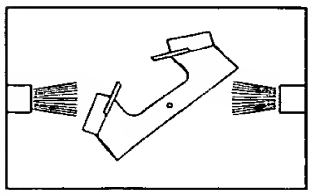




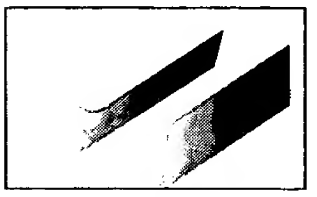

# Basic Factors
of the Dosing Technique



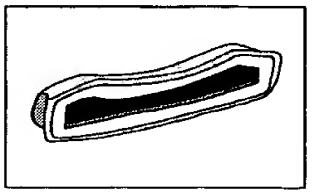
# Chamber Doctor Blade System
Function and Design



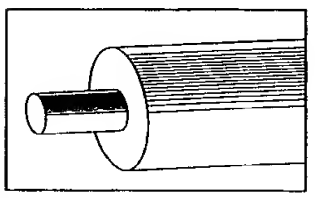
# Chamber Cleaning System



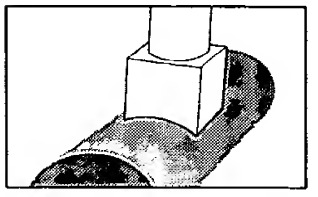
# Doctor Blade



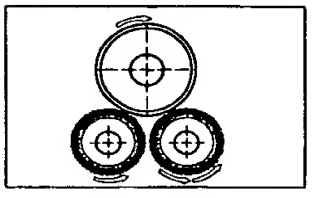
# Seals



# Anilox Rollers

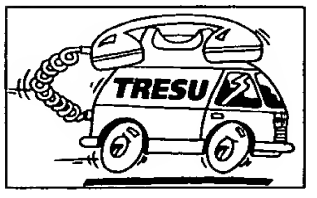


# Printing Plate Cleaner
Function and Design



# Anilox Cleaning System

# Consultation




# Installation and Service

TRESU

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